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the chlorine is found to divide itself equally between the other two.

So also with respect to the relative affinities of carbonic oxide for chlorine or for oxygen. The new gas is not decomposed by oxygen, neither is carbonic oxide altered by admixture with any proportion of chlorine that has been tried.

A Narrative of the Eruption of a Volcano in the Sea off the Island of St. Michael. By S. Tillard, Esq. Captain in the Royal Navy. Communicated by the Right Hon. Sir Joseph Banks, Bart. K.B. P.R.S. Read February 6, 1812. [Phil. Trans. 1812, p. 152.]

The eruption here described by Capt. Tillard was first observed by him on the 12th of June, 1811, having burst forth only two days before. It had been preceded by another eruption in the month of January, about three miles distant. Having come to anchor on the 13th in the road of Porta del Garda, Capt. Tillard set off on the following morning with some other gentlemen, for the purpose of witnessing the phenomena from the adjacent cliffs of St. Michael. The place of the eruption was scarcely a mile from the base of the cliff, which was nearly perpendicular, and about 400 feet high.

In the most quiescent state of the volcano, there appeared a circular body of smoke over the surface of the water, in continual rotatory motion, extending itself to leeward; but suddenly a column of very black ashes and cinders would shoot up, in the form of a spire, inclined from ten to twenty degrees from the perpendicular; and, again, a second, third, and fourth column, each overtopping the preceding, till the last appeared more above the level of the eye than the sea was below it.

When the first impetus that raised the column ceased, the smoke was seen to break into various fanciful forms; some ascending by their proper levity, others carried downwards by the particles of falling ashes, so as to give the appearance of pendent plumes of black and white.

These bursts were always accompanied by vivid flashes of lightning in the densest part, and followed by a succession of water-spouts that appeared drawn up by the masses of smoke as they rolled away before the wind.

The part of the sea where the volcano was situated was known to be full thirty fathoms deep; but in the course of the time that Capt. Tillard and his friends were watching it, a ridge was seen to project above the surface of the water; and before they quitted the cliff, which was in about three hours, a complete crater was formed, apparently 400 or 500 feet in width, and elevated on the leeward side not less than twenty feet in height.

The great eruptions were generally attended with sounds like the firing of cannon or musquetry, and often with slight shocks of earthquake.

On the next day the volcano continued to emit clouds of black smoke and ashes, but was comparatively tranquil.

On the succeeding day, however, the eruptions were repeated with still greater violence than before; and the quantity of matter thrown up subsequent to this period was so great, that upon Capt. Tillard's return to St. Michael's on the 4th of July, one side of the crater was elevated nearly eighty yards above the level of the sea, and the circuit of it so nearly complete, that the channel of communication between the inside and outside was not more than six yards over, and the water within was boiling hot. The beach was also proportionally heated; so that although by rowing round to the leeward side Capt. Tillard was able to land on the outer margin, the heat prevented his ascending at that part more than a few yards. The inclination also was so steep on all sides, as to occasion considerable difficulty in the attempt to reach the summit. The declivity below the surface of the sea was such, that at the distance of twenty or thirty yards the depth was found to be twenty-five fathoms.

A portion, about sixty feet in length, on one side of the opening being separated into a sort of peninsula, this part was chosen for ascending, by means of a narrow isthmus of cinders, that connected it with the rest of the circumference of the crater.

When Capt. Tillard had ascended the ridge, it was found too narrow to walk upon, the descent within being as steep as that on the outside. But the ridge gradually widened toward the other extremity, which was elevated between twenty and thirty feet from the sea, with a flat top, bounded by a precipice on one side of the channel of entrance.

Within the crater was found the skeleton of a guard-fish, so burned as to break to pieces on attempting to take it up; and it was said that great numbers of fish had been destroyed by the eruption, and thrown dead upon the coast of St. Michael.

The general material of which this mound consisted, was found to be a spongy substance like cinders, to which stones had been reduced by the action of heat; but there were also other portions of stone that had undergone no such alteration.

On the primitive Crystals of Carbonate of Lime, Bitter-Spar, and Iron-Spar. By William Hyde Wollaston, M.D. Sec. R.S. Read February 13, 1812. [*Phil. Trans.* 1812, p. 159.]

In consequence of the supposed agreement of these three minerals, in the same primitive form of their crystals, the two latter have been arranged by the Abbé Haüy among those varieties of carbonate of lime which contain substances foreign to its proper chemical nature.

It has been objected to M. Haüy, that the magnesian carbonate of lime, or bitter-spar, is a proper chemical compound, and as such should have a form different from that of mere carbonate of lime; and that since iron-spar frequently contains little or no lime, its crystalline form should also be different.

It is now found by the author of the present communication, that such differences as the theory appeared to require do actually exist.